

The Common Infectious Diseases and Their Prevention

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The Reportable List.

Of the diseases which are reportable to local boards of health there are about forty in the list. Of these a dozen or so have either never been found in Maine or have very rarely been known among us. Aside from the venereal diseases another twelve of the notifiable diseases impose upon the local health officials and the medical profession the bulk of the task of keeping down to the lowest possible limit the sickness-rate and the death-rate and the burden of expense from the communicable diseases. To that end the following brief notes on some of those diseases may be helpful. The full list of the notifiable diseases is printed on the back of "Form 1, Report of Cases of infectious Diseases", which is in the hands of physicians and local boards of health.

Chickenpox.

Altogether too frequently it is happening that smallpox remains for a while uncontrolled, and the final outcome is much illness, disruption of business, and the accumulation of serious expenses to be borne by individuals or by municipalities just because the first cases of smallpox have been mistakenly called chickenpox. But chickenpox is one of the notifiable diseases, and the physician and householder is under the same obligation to report it that he is to report smallpox.

If cases of chickenpox were all reported the local boards of health and the State Department and its district health officers would have a much better chance of preventing the development of epidemics of smallpox from so-called cases of chickenpox. When there is a reported prevalence of chickenpox among adults as well as among children there is good reason for something more than a suspicion that the disease may be smallpox.

Diphtheria

Our system for the registration of deaths in Maine went into effect in 1892, a few years before antitoxin for the treatment of diphtheria came into use. In the first five years of our registration era the average annual number of deaths from diphtheria was 99; and in the last five years, ending with 1918 it was 74. That is something of a gain but it is far from being what it should be. There are several reasons why the death-rate from diphtheria has not been lowered far more than it has. The principal reason why there has not been a far greater lowering of the diphtheria death rate is because all cases of diphtheria have not received diphtheria antitoxin, or have not had it promptly, or have had insufficient doses of it. Experience in treating large numbers of cases with it have shown that, with sufficient dosage of antitoxin on the first day of the disease, practically all patients were saved, and that the longer the delay in receiving the antitoxin the greater the number of deaths.

Though the doses of antitoxin now advised are costly, no child should be allowed to die for the want of it. Whenever antitoxin is needed in a family to which it is not otherwise promptly available, there should be no delay in filling or approving requisitions for it which may come from attending physicians. Local boards of health are fully authorized to do this under the provisions of Sections 70 and 71 of Chapter 19 of the Revised Statutes.

When clinically there is evidence of the probability of diphtheria, there should be no waiting for laboratory reports. Even if negative reports come from the laboratory the prompt use of antitoxin in every case in which the judgment of the

doctor is that it should be used will be a good investment for any town, and should not in the least be thought to be a reflection on the acumen of the doctor, for, without the help of the laboratory, it is beyond the ability of any doctor to make a positive diagnosis of some cases of diphtheria; and again in true diphtheria swabs may fail to bring the bacillus from throat or nasal passages, or the life of the infective agent may be lost in the journey to the laboratory. Aside from its remedial use for the sick, antitoxin should be used for its prophylactic effect when other children in the same family have been, or must be exposed to the infection.

Many cases of diphtheria are not seen by the family physician as early as he should see them for the reason that the poison of diphtheria often has a benumbing or paralyzing effect upon the throat so that there is no complaint of soreness. It would help very much, in saving lives, if parents generally could be made to understand that fatal diphtheria may have its location in the throat, or nose or larynx with the patches of false membrane in some of these locations wholly invisible, and if they would call their family physician early when there is any indication of soreness of the throat, or a nasal discharge, or difficult breathing.

Scarlet Fever.

The germs of scarlet fever leave the sick one in the discharges from the throat and nose and they are frequently present in the discharges from the ear or from abscesses. Children who have had the disease even in a mild form may for some time remain dangerous carriers of scarlatinal infection. The general rule under which health officers work requires the isolation of the patient for a period of thirty days from the onset of the disease. In some mild cases in which the mucous membranes of the throat and nasal passages speedily return to their healthy condition, the month of isolation may perhaps be shortened a little, but in cases in which the inflammation of the throat or nose is protracted, or an abnormal discharge from these parts or from the ear is continued, the only safe course is to prolong the isolation beyond the usual 30 days. The teaching of the Parisian authorities

of twenty years ago or longer that the desquamating particles, or flakes of skin do not bear the infection is now generally accepted.

Of late years the prevailing type of scarlet fever has generally been much milder than it was formerly, but some years ago a malignant type of scarlet fever of more than 30 cases in which 11 children died occurred. All of the families were on the route of one milkman. It was found that the milkman, delivering milk while still desquamating as the sequel of a mild attack of scarlet fever which had not been recognized as such, had thus innocently been the cause of the outbreak. This illustrates two well-known facts: That a malignant type of scarlet fever may be developed from the infection from mild cases; and that the infection of scarlet fever may readily be transmitted through some food products, particularly through milk.

Septic Sore Throat

Nearly all the forms of sore throat and tonsillitis are communicable to other persons. Particularly dangerous infections may be received from cases of scarlatinal sore throat accompanied by no eruption, from diphtheria in which the characteristic false membrane cannot be found, and from septic sore throat, serious outbreaks of which have appeared in various places since the notable epidemic occurred in Boston in 1911. While septic sore throat is communicable from person to person, the investigations of the larger outbreaks have shown that transmission through milk supplies has been the larger factor, the source of the infection probably much more frequently a milker or milk handler than a cow with a diseased or infected udder.

In an outbreak of this kind the first thought of the health officer should be the probability of a milk-borne infection, prescribing at the same time the same precautionary measures against contact infection that he would when dealing with diphtheria or scarlet fever.

Measles and Whooping Cough.

Traditionally these two are classed by many people among the minor infectious diseases, but seen from the point of view

of the number of deaths caused by them they should be considered maladies calling for the most cordial and efficient co-operation of parents and health officers in controlling them. In the five years, 1914-1918, the average yearly number of deaths from measles in our state was larger than that from diphtheria, it lacked only one of being as large as that from scarlet fever and diphtheria; the mortality from measles and whooping cough was nearly twice that of scarlet fever and diphtheria, and within 12 of equalling that from scarlet fever, diphtheria, and typhoid fever. It is high time to get over the do nothing policy with these two diseases. Aside from the deaths charged against them in our registration reports, it is well known that measles and whooping cough are often followed by pneumonia of a serious type or by the awakening to activity of the latent deposits of tubercle which very many persons carry. These two diseases are particularly dangerous to young children. For example of the 598 deaths from whooping cough in the eight years 1910-1917, 575 of them were of children under five years of age; and of the 463 deaths from measles in the same years, 324 were of children under five.

The rules and regulations of the State Department of Health have made measles and whooping cough notifiable diseases to be reported not only by physicians but by householders and teachers, and the policy of the department must be to insist upon the faithful reporting of these diseases. In controlling outbreaks, Circular 224 on measles or Circular 225 on whooping cough should be supplied liberally to families so as to gain their cooperation and self help. The cooperation of the public may be gained more readily by doing promptly and well that which need be done, and that only.

Measles.

One peculiarity of measles causes some difficulty in the early recognition of the disease and therefore in the prompt limitation of the danger from a case. The rash does not appear until four or five days after the onset of the early symptoms which are those of a common cold. Meanwhile from the very first the affected child is infectious.

On the other hand another characteristic, minimizing the trouble from restrictive measures, is that the period of infec-

tivity is very brief after the eruption is out—not more than five days. But the isolation should continue until the temperature has returned to normal and all discharges from the throat, nose and ears, and the rash have disappeared.

The isolation of the patient should promptly follow the appearance of the very first symptoms of a cold in the head when there has been exposure or probable exposure to the disease, or when measles is around, and instead of closing the schools as a protective measure, greater help would come by instructing the teachers to act as is provided in Rule 14 of the Rules and Regulations. Supply each teacher with a clinical thermometer, teach her how to use it and how to disinfect it. Upon the first symptoms of a cold in the head with an accompanying rise of temperature one degree above the normal, the child should be sent home and the case reported to the local board of health for investigation.

Whooping Cough

This disease is spread by contact and by the droplets thrown into the air in coughing. To children with this disease a very great danger is from pneumonia as a complication. As in measles there should be prompt isolation of the child who has the symptoms of a cold with cough when the disease is prevalent or when there is reason to believe there has been exposure to whooping cough. The disease is not so infectious as is measles, but the death-rate of children who take the disease is so great, particularly with those who are under two years of age (501 out of a total of 598 at all ages) that extreme care should be taken to save from infection children of these tender ages.

Influenza.

The average annual number of deaths from influenza in Maine in the twenty years before 1918 had been 206. That was serious enough. But the influenza deaths in 1918 were 2554; or, with the number of pneumonia deaths above the average, the deaths fairly chargeable to influenza numbered 3240.

Whether this calamitous movement of this disease was

due to the importation of a more virulent strain of infection we are not quite sure, but we do know that in the few years which preceded 1918, an unusually malignant type of influenza had been prevalent in many places. In our state in 1916, 449 deaths from that disease were reported, twice that of the average mortality.

It is certainly desirable that we gather from the experiences which we passed through in 1918 what we can to aid us in the future in the control of influenza and the other acute respiratory diseases. Questions regarding some points in the management of these diseases are still debatable, but we may feel assured that the following may be laid down as safe and necessary lines of procedure:

1. When influenza is once well under way it moves with a wild-fire rapidity unequaled by any other disease. Undelayed action is therefore required with the first cases.

2. There should be a prompt compliance with the legal requirement that cases shall be reported to local boards of health and through them to the central office.

3. The isolation of the influenzal patient is just as necessary as though he had scarlet fever or diphtheria; and as the patient is giving off infection very early with the onset of the disease, and as contact in the house is one of the most important of all causes of the spread of infection, the isolation should be prompt and complete.

4. A large part of the work in controlling influenza and the other acute respiratory diseases must be done in the homes of the people. It is therefore very desirable that local health officers and health workers make free use of Circular 241, "Guarding against Influenza and Common Colds," as an aid in teaching families how they may best protect themselves, and in so doing lessen the danger to the public.

5. In the sick-room the sputum should be carefully collected and destroyed, there should be care for the cleanliness of the patient and of everything about him; and attendants should be careful not to be at short range in front of the patient when he sprays infection into the air in coughing or otherwise.

6. Dishes, toilet articles, and the personal and bed clothing of cotton, or linen fabric should be disinfected with boiling water.

7. The final disinfection of the room and its contents should be done by washing up with soap and water or with Solution 7, and by exposure to fresh air and sunshine.

Thus far we may speak with confidence; on other points we cannot lay down rules that are applicable to all places under all conditions.

In regard to closure, some of our large cities that closed schools and other places of assembly made a more unfavorable epidemic record than did other cities with schools and places of amusement running as usual. Apparently closure is more effective in rural communities. The question must be left to the judgment of each local board, as to whether the schools and other places under the existing local conditions, shall be closed.

The face mask affords considerable protection to the nurse if worn when her duties are in the near vicinity of the patient. The mask arrests the moist droplets of infectious matter that may be thrown into the air in the act of coughing, sneezing, or talking. It can be made as described in the circular on "Hints on Home Nursing."

Pneumonia

Tuberculosis and pneumonia have long been keen competitors in the destruction of human lives. For a long time tuberculosis had a distinct lead in this work, but the teaching that tuberculosis is a communicable disease, and is therefore preventable, has lowered very much the tuberculosis death-rate in Maine. Though there appears to be a marked difference in the degree of infectivity and communicability in different cases and different outbreaks of pneumonia, there is reason to believe that, if the public were generally aware of the fact that pneumonia and broncho-pneumonia are communicable diseases, and if intelligent care were generally observed to guard other persons from the danger of the infection that the pneumonia patient is giving off, there would be a considerable reduction in the death-rate from these respiratory di-

seases. The precautionary rules to follow in pneumonia and the other acute respiratory diseases are just those given under the preceding sub-head, and in Circular 241 Guarding against Influenza and Common Colds.

Infantile Paralysis (Poliomyelitis).

The history of this communicable disease has shown occasional serious epidemics followed by a series of years in which there have been only sporadic cases. For instance, in 1910 cases of poliomyelitis were reported in 84 of our Maine towns, with the disease in only 12 towns in 1911. In the four years 1912-1915 the yearly average of towns from which this disease was reported was seven or an average of 10 cases a year. The year 1916 was noted for the wide prevalence of infantile paralysis. In Maine it was found in 52 towns, with reports of it in only 11 towns the following year.

Whether found in epidemic years or at other times, prompt action should be taken in connection with every case to prevent the spread of the infection.

Typhoid Fever

The onset of typhoid is gradual and insidious so that ordinarily there is difficulty in making a diagnosis in the first few days, and in mild or walking typhoid the uncertainty as to the nature of the disease is usually more prolonged. Further, diagnostic help from the laboratory through the Widal reaction is usually not available in the first week of the disease or longer. Meanwhile the typhoid bacillus very early permeates every part of the body and its excretion in the fecal and urinary discharges of the patient may be going on some time before a positive diagnosis can be made. Prompt precautions should therefore be in force as soon as there is a suspicion of typhoid fever, that other persons may not be infected even in the developmental stage of the disease.

The special death-rate from typhoid fever in Maine is now less than one fourth of what it was when the registration of deaths began in 1892, due to improvements in our public water supplies and, to a lesser extent, to improvements in our milk supplies. If a much greater lowering of the typhoid

death-rate is to come, a good part of the work must be done in homes where careful instruction has been received that typhoid is not only a water-borne and milk-borne disease, but that it is one of the diseases which is very often received by "contact infection", direct or indirect. These are some of the facts that should always be borne in mind in the presence of plain or suspected cases of typhoid fever:

1. In closely associating with a person sick with typhoid fever there is a real danger of taking the disease directly or indirectly from the patient. To ensure safety constant vigilance is required in following the rules given in the circulars of the Department relating to this disease. Even among the nurses and other attendants on typhoid fever patients, in some of the hospitals in this state and elsewhere, there have in the past been numerous instances of the contraction of the disease by these caretakers of the sick in spite of their special training for this work. Nurses for typhoid patients and the other members of afflicted families should invariably be protected by anti-typhoid vaccination.

2. There is a serious danger of fly-borne infection when flies have access to the dejections from typhoid patients. In guarding against this danger, flies must be banished from the sick room, from kitchen, pantry and dining-room where food is prepared, stored, or served, and from the place of final disposal of the discharges from the patient. The new laws or regulations in some of the Southern States requiring absolutely fly-proof privy vaults promises to give them a distinct lead in public health records in some directions.

3. The bacillus of typhoid fever is not so readily destroyed by drying or by sunlight as are some other infective organisms. Everything in the sick-room that has had a chance to become infected—towels, handkerchiefs, bed linen, body linen, and other fabrics, and the floors and their coverings—should therefore receive a careful disinfection.

4. Milk, handled by infectious persons, may not only serve as a carrier of typhoid infection, but may become a culture medium for the rapid multiplication of the typhoid bacillus. A milk supply that comes from a typhoid home or

that has been handled by persons living with typhoid patients must be shut off promptly until the precautionary measures provided in Rule 20 of the State Department of Health can be put into effect.

5. The organism causing typhoid fever may retain its vitality some time in water, particularly in cold weather. Well water supplies should be carefully guarded from the chances of surface drainage or of soakage through the soil into the wells. Streams receiving typhoid infection sometimes transmit it long distances down stream—for 75 miles as occurred in the winter of 1904 when the infection was carried by the Penobscot waters from Millinocket to Old Town and Bangor giving rise to serious epidemics in those two cities, then using river water without due protection.

Infectious Diarrheal Diseases.

In the summer and fall of 1918 serious epidemics of dysentery and infectious diarrheal diseases were prevalent in several places in the state, causing much suffering and a rather high mortality rate. The rapid transmission of the disease from person to person was repeatedly shown. In one instance, the disease spread rapidly to all the members of a family after the infection had been brought to their home by a young man who came from another town with a diarrheal disease. These diarrheal diseases are not stamped plainly enough in the minds of the people as serious communicable diseases, and for this reason Circular 229, on that subject, will have a wide distribution as needed.

Two Groups of Diseases.

Aside from a certain class of diseases that are transmitted through bites or other wounds inflicted by insects or the higher animals, the infectious or communicable diseases that collectively cause more illness and destroy more lives than all other maladies may be arranged in two groups.

In guarding against the infectious diseases it is very important that we have trustworthy information as to how the infection is given off from the sick one and how it is received and

taken in by other persons. It will be helpful to keep this group arrangement constantly in mind:

GROUP: 1.—Diseases which are spread largely through the secretions or discharges from the nose, throat or mouth. This group includes diphtheria, scarlet fever, measles, influenza and colds, pneumonia, tuberculosis, infantile paralysis, epidemic meningitis, mumps, whooping cough, and German measles.

GROUP 2.—Diseases spread largely by excreta the fecal and urinary discharges particularly. This group includes typhoid fever, paratyphoid fever, dysentery, infectious diarrhea, and cholera.

TRANSMISSION IN GROUP 1.—Taking diphtheria or scarlet fever or measles or influenza as a representative of the first group, the source of infection is the secretions of the mucous membranes of the nose and mouth, or at least what is ejected from those orifices of the body; and the infection enters the bodies of secondary victims by the same routes.

PREVENTION IN GROUP 1.—One very frequent error in guarding against the spread of the infectious diseases generally is the delay in beginning the required precautionary measures. Measles is dangerously communicable from the appearance of the first symptoms, several days before the rash appears. Diphtheria or scarlet fever may be given while there is apparently nothing but a simple sore throat, no visible false membrane in diphtheria and no eruption in scarlet fever. In addition to getting on the safe side early,—waiting only for reasonable grounds for the suspicion that the oncoming trouble may be one of the diseases in the first group—the following steps should be taken:

1. Keep the sick one apart from other persons, particularly away from children and others who have never had the suspected disease. Exclude all unnecessary visitors from the sick room.

2. The one who cares for the sick should keep away from others in the family. She should remember that the infection is only in the immediate vicinity of the patient. If it finds its ways elsewhere it is carried, (1) by the sick person, (2) by the hands or the clothing of those who care for the sick, (3) by the

things used by the sick one. So, before leaving the room and going among other persons, the nurse must wash her hands carefully with soap and water, and, if she can, with a disinfecting solution. A protective outer garment worn in the sick-room should be slipped off. But the washing of her hands should be the last thing.

3. Guard against the soiling of clothing, bedding, and other things with what is coughed up or spit out. Receive it on bits of rag, paper, or in burnable spit-cups and burn it.

4. One of the chief ways in which these diseases are spread is from mouth to mouth—letting another person use a drinking cup, or a spoon, or anything else which has been to the mouth of the sick one, or has in any way been soiled with the infectious secretions from the mouth or nose. Even when nothing more serious among the diseases of group one than a common cold has entered a household, all teaspoons, forks, cups, and other things which might transmit infection should be disinfected with boiling water after every washing.

5. In the room occupied by the sick one, and particularly near him, those who care for him, or associate with him are endangered by the infectious droplets or particles which are sprayed in to the air when the patient coughs, or sneezes, clears his throat or otherwise forcibly expels the air from his lungs. Patients should be instructed not to cough in the faces of attendants or associates, and nurses should have a care for their own safety.

TRANSMISSION IN GROUP 2.—In typhoid fever or the other diseases of this group two, the source of infection is the dejecta—the solid and liquid discharges from the patient; and the disease is transmitted to others by their receiving, by mouth, particles of the infectious matter into their digestive tracts. A mere invisible trace upon fingers washed not carefully enough may suffice, or a trace transported by flies or otherwise to food or drink. Here again, in this group, infection may be transmitted while the disease is showing its earliest symptoms. *This fact shows the need of beginning precautionary measures promptly* while the case is only a “suspect” as the regulations of the State Department of Health provide shall be done.

PREVENTION IN GROUP 2.—A known or suspected case of typhoid fever or other disease in group two requires the following measures:

1. All discharges from the patient should be disinfected promptly with the disinfecting solutions (Solution 4, solution 8, or solution 7 double strength advised in Circular 220), or, with greater certainty, by carrying the vessel out and pouring into it boiling water, six or eight times as much as that of the material to be disinfected. Keep from rapid cooling.

2. Even after their disinfection the final disposal of the discharges should be such that there is no possibility of the pollution of wells, or other sources of water supplies, and so that the infection, if any still remains, may not be carried by flies.

3. The same care should be observed as in group one against soiling articles with the infectious discharges and in banishing flies from the sick room.

4. In these diseases there is just as great need as in group one, if not greater, for those who nurse the sick to keep their hands washed and disinfected so as to avoid the danger of finger-borne infection.

For diseases of group two, the danger of water-borne and milk-borne infection has long been emphasized, but the great danger from direct infection—contact infection—is now well known.

Quarantine and Isolation.

In its rules relating to the infectious diseases it is the aim of the State Department of Health to first ensure the public safety, and next to make the necessary restrictive measures just as little troublesome as possible to individuals and to the public. Quarantine or control is therefore divided into three degrees of stringency; full quarantine, modified quarantine, and observation.

For only four diseases is full quarantine prescribed, and the only one of these that we have had among us for many years is smallpox.

Under modified quarantine may be classed those diseases

under which most of the work of local boards comes, for example; diphtheria, scarlet fever, typhoid fever, paratyphoid fever, measles, septic sore throat, dysentery, poliomyelitis, and cerebrospinal meningitis. With the careful isolation of the sick one in a special room, the bread-winners of the family, particularly the head of the household may be permitted to attend to his usual work if he can be trusted to follow the instructions of the executive health authority, and if his work does not bring him into too intimate association with other people, particularly children.

Under the degree of quarantine known as observation we have, with other diseases, chickenpox, German measles, mumps and whooping cough. The health authorities are authorized to exercise such a degree of supervision and control over persons who have any disease for which "observation" is prescribed as may be deemed necessary to prevent their becoming dangerous to the public.

Under one of the rules the health officer may place temporarily under quarantine or observation exposed persons and suspects, and under another rule, when any orders or regulations relating to modified quarantine or observation are violated or disobeyed, the offending persons may be placed under full quarantine or modified quarantine.

For a fuller and more authoritative understanding every health officer and health worker should make a careful study of the Rules and Regulations of the State Department of Health.

Closure of Schools.

The State Department of Health very often has cause to regret that schools are closed forthwith upon the appearance of a few cases of diphtheria, scarlet fever, smallpox or other infectious disease in a community, instead of putting into operation more modern and usually more efficient plans of defense. In the presence of outbreaks or epidemics of unusual magnitude there are certainly sometimes good reasons for closing the schools for a while, particularly when the schools are in the pathway of so rapidly a moving epidemic as that of 1918, but in most outbreaks of moderate extent or

severity it is much better to put promptly into operation a program about as follows:

1. A prompt and cordial cooperation of the school officials and teachers on one side with the state and local health authorities on the other. The public health laws and the school laws and the rules and regulations and a few words about the advantages of this special kind of cooperation are given in Circular 228 of the State Department of Health.

2. Every case of infectious disease and every suspicious case should promptly be excluded from the school room and arrangements be quickly made for the home isolation of all cases and of all suspects.

3. The teachers should be instructed to keep a close watch over all of their pupils for any symptoms that may indicate the probable onset of the disease in question, and they should promptly report all such suspicious cases to the local health officer or school physician. They should also report every case of absenteeism, and there should be arrangements for the investigation without delay of the reason for the absence of any pupil. If the help of a public health nurse or a school nurse is available it will very much facilitate this part of the work and make it more efficient. To help the teachers a copy of Circular 227 should be put into the hands of each of them with a copy also of 228.

4. If any schoolroom has become infected it may ordinarily be disinfected between the school session of one day and that of the next by scrubbing the floors with soap and water or with disinfection Solution 7 (6 ounces of formaldehyde to one gallon of water), when that is available, wiping off with special care with the same solution the desk and seat which had been occupied by the infectious pupil. There is no need of any kind of fumigation of such rooms. Circular 220 gives more detailed advice about disinfection.

There are some distinct advantages in formulating a plan along these lines in advance of trouble and in adhering to it when trouble comes. Well carried out, it is better assurance of the public safety than would be the closure of the schools.

Under the supervision of the teachers who have received instructions, cases of infectious diseases are very often detected that would not be reported or found if the schools were closed. A secondary advantage is that school time and school money are not being wasted.

Dish Washing.

When infectious diseases are about the great danger of the transmission of infection by table ware and eating and drinking utensils should be borne in mind. That danger has been emphasized in the circulars of the State Department of Health. Observations made in connection with the influenza epidemic of last year presents us with further evidence of the gravity of this danger. In our army there were two general methods of cleaning the eating utensils; one in which the dishes were washed in boiling water, the other by the "old line method" in which each soldier washed his own kit in the water used by his comrades. In an experimental way in the same camps groups of two hundred men washed their dishes in the old way in water cool enough to be borne by the hands, while the dishes of other groups of the same number were washed in boiling water. In one army camp the number of men per thousand who came down with influenza among those with the old line method was 298 and among those using the boiling water it was only 46 per thousand. In other camps the influenza incidence among the soldiers under the old method was 4 or 5 times as great as among those for which their dishes were sterilized with boiling water.

The same kind of investigation was carried out in civil life in restaurants and the large department stores where the sickness rate was found to be 9 and 13 per thousand among employees where boiling water was used, 240 and 84 per thousand where the hand method was used.

In private life and everywhere particular care should be taken to sterilize with boiling water cups, spoons, forks, and everything else that is to be carried to the mouth.

Reciprocal Notification.

We appeal to local boards of health when investigating an infectious case or outbreak to get at the source of the infec-

tion. Every case of communicable disease comes directly or indirectly from some other case. To learn whence the infection came will often facilitate the doing of good work and save much trouble and expense for your own community.

And whenever anything comes to the attention of a local health officer that indicates a possibility of danger to persons in another town, make it a rule to report the matter promptly to the State Department of Health so the department may notify the other place to take action. In addition to the notice to the central department, it is still better to send a telephone message direct to near-by towns, when, to them, help may thus be given. There should be just as full and cordial a system of cooperation between towns and between states in this work against the infectious diseases as is possible.

Disinfection.

Three natural disinfecting agencies, *sunlight*, *fresh air* and *drying* are valued more highly now by the health officer than in years gone by. Three trustworthy artificial agents are *cleanliness*, *heat*, and *chemicals*.

Sunshine.

The infectious organisms of nearly all the communicable diseases are rapidly destroyed by direct sunshine, and more slowly by diffused sunlight. Protected by the folds of clothing, or packed away in trunks or boxes and excluded from the air as well as light, infected articles may retain their infectivity some time.

Things that cannot be subjected to boiling or other certain disinfecting processes should be exposed to direct sunshine several days. Such articles are woolen clothing, rugs, carpets and upholstered furniture. Then keep the sick room exposed to as much sunshine as possible for some further days.

Air and Drying.

The action of fresh air and the process of drying destroys the life of the disease germs of many of the infectious diseases. These organisms are one-celled plants depending for their life

upon the retention of a due supply of water within them. Darkness and dampness conserve their vitality while lowering the degree of resistance of the patient and his recuperative power. During the illness and all through convalescence, the sick-room should be reasonably well ventilated and filled with as much sunshine as may be comfortable for the patient.

Cleanliness.

Soap and water and, when need be, the scrubbing brush remove dirt and with it disease germs. Cleanliness is a fundamental requirement in the infectious disease sick-room—cleanliness of the room, of the bed-clothing, and especially of the hands and face of the patient and the eating, drinking and other utensils used by him. Still more important if possible is cleanliness and intelligent care on the part of the attendant in her work of caring for the patient and the sick-room.

Heat.

The most trustworthy and efficient of disinfectant agencies is heat. Sputum or other infective discharges are disinfected for a certainty when burned. The infection of nearly all diseases may be destroyed with moist heat at a temperature considerably below the boiling point of water—say at 150° F. for some time, but the nearer 212° F. the better.

Infectious discharges from the bowels may be disinfected by pouring upon them a quantity of boiling water six or eight times that of the matter to be disinfected.

Milk, often the carrier of the infection of typhoid fever, scarlatina, diphtheria, septic sore throat, tuberculosis and some other diseases may be rendered harmless by bringing it to the boiling point.

Spoons, forks, cups and other eating utensils are the most easily and effectually disinfected by pouring water over them.

So far as such things can be subjected to the process, cotton and woolen fabrics, handkerchiefs, towels, personal clothing and bed clothing are disinfected with the greatest degree of certainty by immersion in water or soap suds and later boiling a few minutes.

Chemical Disinfectants.

So frequent fatalities result from having carbolic acid or bichloride of mercury in households that it is best to discourage the use of these chemicals as disinfectants. Other chemical agents that are much safer are also more efficient germ-killers.

Solution 4, of the State Department of Health, is made by dissolving six ounces of chloride of lime in one gallon of water. It is used principally for the disinfection of dejecta—the disinfection of infectious discharges in the sick-room or the contents of privy vaults.

Solution 7 is made by pouring six ounces of the 40 per cent. formaldehyde into one gallon of water. Clothing may be disinfected by immersion in it; floors and woodwork and upholstered furniture may be scrubbed, sprayed or brushed over with liberal quantities of it; rugs and carpets may be sprayed plentifully, then rolled up and tied up tightly to remain thus for a few hours.

Solution 8 is made by mixing two ounces (4 tablespoonfuls) of either Kreseol or Coro Noleum with one gallon of lukewarm water and stirring or shaking thoroughly. It may be used full strength for the disinfection of sputum or typhoid discharges. For other purposes, such as indicated for *Solution 7*, it may be used half strength.

Time an Important Element.

It should be remembered that in disinfecting by immersion in solutions or in hot water, time is a very important factor. For the disinfection of excreta in typhoid fever, ample time, preferably several hours, should be given for the penetration of the solid matter by the disinfectant.

Whooping-cough.

State Department of Health of Maine.

To lower the unnecessary death-rate of the babies and younger children, this disease, whooping-cough, as well as measles must be controlled better than it is. Like measles, whooping-cough is a dangerous disease for young children. In the last six years, measles caused 303 deaths in Maine, while whooping cough did still worse, for 430 deaths were caused by that disease in the same time.

How Spread.

The infective agent of whooping-cough is received into the system through the nose and mouth, and after the child begins to show symptoms, he gives off the infection in what comes from the nose and mouth. Particularly when coughing, the infection is thrown into the air so that other persons may breathe it in. The infection may also be carried from the sick to the well by means of infected fingers, spoons, towels, drinking cups, or other things which may carry the infection directly from infectious persons to the mouth or nose of others.

Infective Period.

After a child who has never had whooping-cough has been exposed to that disease, from 6 to 14 days pass without a symptom. Then if he has taken the disease, the eyes of the child become reddened and he appears as though he had a slight cold. The cough, instead of becoming better in a short time as in an ordinary cold, becomes more frequent and more

troublesome. After some days, and in many cases it is some weeks, the spasmodic or "whooping" stage begins.

From the day in which the first symptoms show themselves, the child is infectious and may give the disease to other children; and from the beginning of the symptoms for five weeks and until the whoop has ceased entirely, the child should be kept from school and Sunday school and away from all children who have not had whooping-cough. So, just as in measles, the work of keeping the disease from spreading must begin early—with the child who has been exposed from the time of the very first symptoms or before.

Weighing the Danger.

Does the mother who exposes her baby to the infection of whooping-cough weigh the danger? If she carelessly or ignorantly lets her baby, in its first year, have the disease, she cuts down its chances of living from ten to fifty per cent. That is, from ten to fifty of the babies out of every hundred who suffer an attack of whooping-cough die. And then, in addition to that, the various complications which follow whooping-cough carry off many other children.

Nine-tenths of the children who die from the results of whooping-cough are taken off by broncho-pneumonia. Tuberculosis somewhat frequently follows whooping-cough. The severe and frequently repeated attacks of coughing, ending in vomiting, make it very difficult to keep up the nutrition of the child. Convulsions and even hemorrhage into the brain sometimes result from the intense congestion of the head and brain, which accompany what very often looks like a life and death struggle of the little one to get its breath.

For the Welfare of the Sick Child.

1. As the death-rate among children who have whooping-cough is very much greater when they have the disease in their first few years, they should be guarded from this danger in their earlier years. Children under five should be carefully shielded and so should all who are sick or enfeebled by other causes. It should also be remembered that whooping-cough is more dangerous in the cold season than in warm weather.

2. As the death-rate is much greater among children who are not well nourished and among those where the air and other

conditions in the home are not good, they should be kept in the open air as much as possible when the weather permits. When indoors they should have well-ventilated rooms, but they should be protected from direct drafts. It is still more important not to let them stay in too hot or too dry an atmosphere.

3. Indoors or out, the life of the whooping-cough child should be quiet mentally and physically. Too vigorous exercise or the excitement of laughing or crying serves to bring on attacks of coughing and the vomiting which often accompanies the paroxysms of coughing.

For the Safety of Other Children.

One of the most eminent of our medical authors says: "There is perhaps no other disease causing the same amount of suffering and the same danger to life as whooping-cough in which there is an equally shocking disregard of the rights and feelings of others."

Whooping-cough is one of the diseases that must be reported to the local board of health, and while strict quarantine of the family is not required, the local board has full authority to require parents to keep infectious children from coming in contact with other children.

For the good of the children, parents and teachers should be willing to work with the local boards of health to carry out these rules.

1. Whether indoors or out, keep the child who has whooping-cough away from other children who have not had that disease. It is just as important not to let the child spread infection who has been exposed and is showing those first symptoms which may mean whooping-cough—reddened eyes, a little cold in the head, and a beginning cough—for the disease is infectious at this early state. This means that we must think and act early.

2. For the safety of children in the same family who have not had whooping-cough, the sick one should be especially cared for in a room by himself. The infection usually does not involve the whole house; but the danger to the other children is in coming in contact with the sick one or in having the infection *carried* to them: (a) by the hands and perhaps by the clothing of those who take care of the sick; (b) by the things which have been used by the sick one.

3. The attendant upon the child with whooping-cough should have washbasin, soap and towel used by no one else, and when she must leave the sick one she should wash her hands very carefully before she touches things to be used by other persons.

4. The sick one must have drinking cups, spoons, towels, napkins, handkerchiefs, and everything else for his own use which might carry infection to others if they are used in common, for the surest way of carrying infection is by means of those things which may carry it directly to the mouth or nose.

5. The infection of whooping-cough is short-lived. A formal disinfection of the house is therefore not needed if the child recovers. If it dies, particularly before it has been sick long, the sick-room and its contents should be carefully cleaned and disinfected—cleansing, airing out, and exposure to sunshine. Disinfect the things used by the sick child by washing, boiling, or by steam disinfection.

Save the babies. Eliminate whooping-cough and measles. These two diseases, and the troubles that follow them, kill many babies every year.